CLAIMS:

1. An energy conditioner comprising:

an A conductor including an A overlap portion and an A1 tab, wherein said A overlap portion has A major surfaces and A side edges between said A major surfaces;

a B conductor including a B overlap portion and a B1 tab, wherein said B overlap portion has B major surfaces and B side edges between said B major surfaces;

a G conductor including a G overlap portion, a G1 tab, and a G2 tab;

at least one dielectric material;

wherein said A overlap portion, said B overlap portion, and said G overlap portion define an overlap region;

wherein said G overlap portion is between said A overlap portion and said B overlap portion;

wherein said A overlap portion, said B overlap portion, and said G overlap portion are conductively isolated from one another in the overlap region;

said G conductor is conductively isolated from said A conductor and said B conductor; and

wherein said at least one dielectric material covers side edges of said A overlap portion and said B overlap portion.

2. The conditioner of claim 1 wherein said A conductor has no other tab than said A tab.

3. The conditioner of claim 2 wherein said B conductor has no other tab than said B tab.

4. The conditioner of claim 3 wherein said G conductor has no other tabs than said G1 tab and said G2 tab.

5. The conditioner of claim 1:

wherein said A tab has an A tab substantially flat surface at the region where said A tab extends out of said overlap region; and

wherein said A tab substantially flat surface is covered by said at least one dielectric material where said A tab extends out of said overlap region.

6. The conditioner of claim 1 wherein said A overlap portion, said B overlap portion, and said G overlap portion define a layered structure.

7. The conditioner of claim 1 further comprising a first outside conductive path, said first outside conductive path being outside said overlap portion, said first outside conductive path connecting said G1 tab to said G1 tab, wherein said first outside conductive path has a first outside conductive path cross section, and said first outside conductive path cross section is not circular.

8. The conditioner of claim 7 wherein said first outside conductive path cross section is at least 1 millimeter wide.

9. The conditioner of claim 7 wherein said first outside conductive path cross section is at least 5 millimeters wide.

10. The conditioner of claim 7 wherein said overlap region has an overlap region width along an extension direction both perpendicular to a line segment connecting said G1 tab and said G2 tab and parallel to said major surfaces of said A conductor, said first outside conductive path cross section along said extension direction is at least 10 percent as wide as said overlap region width.

11. The conditioner of claim 19 wherein said first outside conductive path cross section in said extension direction is at least 20 percent as wide as said overlap region width.

12. The conditioner of claim 19 wherein said first outside conductive path cross section in said extension direction is at least 50 percent as wide as said overlap region width.

13. The conditioner of claim 7 wherein said first outside conductive path projects not more than 5 millimeters from an outer major surface of one of said A overlap region and said B overlap region.

14. The conditioner of claim 7 wherein said first outside conductive path and a facing outer major surface of that one of said A overlap region and said B overlap region facing said first conductive path defines an area of less than 30 square millimeters.

15. The conditioner of claim 1 wherein said A1 tab and said B1 tab project out of said at least one dielectric material.

16. The conditioner of claim 15 wherein said A conductor, said B conductor, and said G conductors are designed to connect said A1 tab and said B1 tab to lines connecting to a source of electric power.

17. The conditioner of claim 15 wherein said A conductor, said B conductor, and said G conductor are designed to connect said A1 tab and said B1 tab to data or control lines.

18. The conditioner of claim 1 wherein said G1 tab extends out of said overlap region in a G1 tab direction, said A1 tab projects out of said at least one dielectric material in an A1 tab direction, said B1 tab projects out of said at least one dielectric material in a B1 tab direction, and said G1 tab direction is different than both said A1 tab direction and said B1 tab direction.

19. The conditioner of claim 18 wherein said G1 tab direction is different from each of said A1 tab direction and said B1 tab direction by at least forty five degrees.

20. The conditioner of claim 18 wherein said G1 tab direction is different from each of said A1 tab direction and said B1 tab direction by about ninety degrees.

21. The conditioner of claim 1 wherein said A1 tab, said B1 tab, and said G1 tab are located at different positions along a overlap direction perpendicular to said A major surfaces such that said different positions have no overlap along said overlap direction.

22. The conditioner of claim 1 wherein portions of said A1 tab, said B1 tab, said G1 tab, and said G2 tab that are not coated or potted with dielectric are sufficiently spaced apart to prevent dielectric breakdown, or flash-over, in air, when 120 volt 60 cycle power is applied across said A1 tab and said B1 tab.

23. The conditioner of claim 22 wherein portions of said A1 tab, said B1 tab, and said G1 tab, that are not coated with dielectric are spaced from one another by at least 3 millimeters.

24. The conditioner of claim 1 wherein portions of said A1 tab, said B1 tab, said G1 tab, and said G2 tab that are not coated or potted with dielectric are sufficiently spaced apart to prevent dielectric breakdown, or flash-over, in air, when 230 volt 50 cycle power is applied across said A1 tab and said B1 tab.

25. The conditioner of claim 24 wherein said A1 tab, said B1 tab, and said G1 tab, that are not coated with dielectric are spaced from one another by at least 5 millimeters.

26. The conditioner of claim 1 wherein:

each tab has a cross section having a cross section height and a cross section width;

said overlap region defines an overlap direction perpendicular to said A major surfaces, said cross section head measured along said overlap direction;

each tab has a width measured in a direction parallel to a plane defined by said A major surface and perpendicular to a direction along which the tab projects from said overlap region;

each cross section of said A1 tab and said B1 tab has a width to height ratio of at least 2.

27. The conditioner of claim 26 wherein each cross section of said A1 tab and said B1 tab has a width to height ratio of at least 6.

28. The conditioner of claim 26 wherein each cross section of said A1 tab, said B1 tab, and said G1 tab has a width to height ratio of at least 10.

29. The conditioner of claim 1 wherein said at least one dielectric material covers said A major surfaces and said B major surfaces.

30. The conditioner of claim 1 wherein at least said overlapped portion is potted.

31. The conditioner of claim 1 wherein at least all portions of said A1 tab and said B1 tab that project 0.1 millimeter out of said overlap region are covered with said at least one dielectric material.

32. The conditioner of claim 1 wherein at least all portions of said A1 tab and said B1 tab that project 1.0 millimeter out of said overlap region are covered with said at least one dielectric material.

33. The conditioner of claim 1 wherein at least all portions of said A1 tab and said B1 tab that project 2.0 millimeters out of said overlap region are covered with said at least one dielectric material.

34. The conditioner of claim 1 wherein at least all portions of said A1 tab and said B1 tab that project 5.0 millimeters out of said overlap region are covered with said at least one dielectric material.

35. The conditioner of claim 1 wherein:

said A overlap portion has an A overlap portion height along an overlap direction, said overlap direction being perpendicular to said A major surfaces;

said A1 tab projects out of said overlap region by an A1 tab projection length; and

a ratio of said A1 tab projection length to said A overlap portion height is at least 2.

36. The conditioner of claim 1 wherein said ratio is at least 5.

37. The conditioner of claim 1 wherein:

said overlap region has an overlap region height along an overlap direction, said overlap direction being perpendicular to said A major surfaces;

said A1 tab projects out of said overlap region by an A1 tab projection length; and

a ratio of said A1 tab projection length to said overlap height is at least 2.

38. The conditioner of claim 37 wherein said ratio is at least 5.

39. The conditioner of claim 1 wherein height is defined along a direction being perpendicular to said A major surfaces, and said A1 tab, said B1 tab, and said G1 tab are all at different heights relative to one another.

40. The conditioner of claim 1 wherein the only side surfaces of said A conductor, said B conductor, and said G conductor not covered with dielectric are surfaces of tabs outside of said overlap region.

41. The conditioner of claim 1 wherein said A conductor includes an A2 tab, and said A1tab and said A2 tab protrude from said overlap region on opposite sides of said overlap region.

42. The conditioner of claim 41 wherein said B conductor includes a B2 tab, and said B1 tab and said B2 tab protrude from said overlap region on opposite sides of said overlap region.

43. The conditioner of claim 42 wherein said A1 tab and said B1 tab protrude from said overlap region on the same side of said overlap region as one another.

44. The conditioner of claim 43 wherein said A2 tab and said B2 tab protrude from said overlap region on the same side of said overlap region as one another.

45. The conditioner of claim 43 wherein said G1 tab and said G2 tab protrude from said overlap region on different sides from said A1 tab and said A2 tab.

46. The conditioner of claim 42 wherein there exist only two tabs for each one of the A and B conductors.

47. The conditioner of claim 1 wherein there exist two and only two G tabs, said G1 tab and said G2 tab.

48. The conditioner of claim 1 wherein at least one of said A1, B1, and G1 tabs have a bend.

49. The conditioner of claim 1 wherein at least two of said A1, B1, and G1 tabs have a bend.

50. The conditioner of claim 1 formed by a process including:

forming a component part of said conditioner by metallizing a planar dielectric

element to form metal on both major surfaces of said planar dielectric element.

51. The conditioner of claim 50 wherein said process further includes:

contacting an overlap portion of a planar metal element having an overlap portion and a tab portion to one metal surface of the metallized component part; and

integrating said planar metal element with said component part such that said planar metal element is conductively connected to said one metal surface and said tab portion does not oppose a major surface of said component part.

52. The conditioner of claim 1 wherein said A conductor comprises a first metallization layer deposited on a first dielectric element and a first additional planar metal element having one section conductively bonded to said first metallization layer and another section defining at least said A1 tab.

53. The conditioner of claim 52 wherein said B conductor comprises a second metallization layer deposited on a second dielectric element and an second additional planar metal element having one section conductively bonded to said second metallization layer and another section defining at least said B1 tab.

54. The conditioner of claim 53 wherein said G conductor includes a third metallization layer deposited on a third dielectric material and a third additional metal element having one section conductively bonded to said third metallization layer and another section defining said B1 tab.

55. A connector comprising the conditioner of claim 1, wherein:

said connector comprises an A pin structure, a B pin structure, and a conductive housing;

said A pin structure includes a male or female pin and a first A conductive path extending to and conductively contacting said A1 tab;

said B pin structure includes a male or female pin and a first B conductive path extending to and conductively contacting said B1 tab; and

said conductive housing substantially encloses said A conductor, said B conductor, said G conductor, and at least a portion of said A pin structure and said B pin structure.

56. The connector of claim 55, wherein:

a first outside conductive path outside said overlap region connects said G1 tab to said G2 tab.

57. The connector of claim 56 wherein said first outside conductive path extends between said first A conductive path and said first B conductive path without encircling either said first A conductive path or said first B conductive path.

58. The connector of claim 57 further comprising a second outside conductive path outside said overlap region and also connecting said G1 tab to said G2 tab.

59. The connector of claim 58 wherein said second outside conductive path and said first outside conductive path extend around said overlap region to define a loop around said overlap region between said A1 tab and said B1 tab that does not encircle any conductive path connected to either said A1 tab or said B1 tab.

60. The connector of claim 59 further comprising:

a third outside conductive path outside said overlap region and connecting said G1 tab to said G2 tab;

a fourth outside conductive path outside said overlap region and connecting said G1 tab to said G2 tab;

wherein said third outside conductive path encircles a conductive path extending from said A1 tab; and

wherein said fourth outside conductive path encircles a conductive path extending from said B1 tab.

61. The connector of claim 60 further comprising a conductive housing substantially enclosing said conditioner.

62. The connector of claim 61 wherein at least a portion of said third outside conductive path and a portion of said fourth outside conductive pathway pass through said conductive housing.

63. The connector of claim 59 further comprising:

an electrically insulating structural support element;

a second A conductive path and conductively contacting said A1 tab and extending from said A1 tab away from said A pin structure and said B pin structure:

a second B conductive path conductively contacting said B1 tab and extending from said B1 tab away from said A pin structure and said B pin structure;

wherein said electrically insulating structural support element structurally supports material forming said second A conductive path and said second B conductive path.

64. The connector of claim 63 wherein said second outside conductive path extends from said G1 tab around said electrically insulating structural support element, and between said second A conductive path and said second B conductive path, and then to said G2 tab without encircling any conductive path connected to either said A1 tab or said B1 tab.

65. The connector of claim 55 wherein said A1 tab has a relatively flat major surface.

66. The connector of claim 65 wherein said B1 tab has a relatively flat major surface

67. An electrical device comprising the conditioner of claim 1, wherein:

said device comprises a load, a first input line, a second input line, and a conductive housing;

said first input line conductively connects to said A conductor;

said second input line conductively connects to said B conductor; and

said conductive housing substantially encloses said overlap structure, said A1 tab, said B1 tab, said G1 tab, said G2 tab, and said load.

68. The device of claim 67 further comprising a first outside conductive path outside said overlap region, said first outside conductive path connecting said G1 tab to said G2 tab.

69. The device of claim 68 further comprising a second outside conductive path outside said overlap region, said second outside conductive path connecting said G1 tab to said G2 tab, and said first outside conductive path and said second outside conductive path define a loop passing encircling conductive paths conductively connected to said A conductor and said B conductor.

70. The device of claim 69 wherein said G conductor is conductively connected to said conductive housing.

71. The device of claim 67 wherein said device defines a first conductive path passing from said G conductor between an A conductive path conductively connected to said A conductor and a B conductive path conductively connected to said B conductor without encircling either said A conductive path or said B conductive path.

72. The device of claim 71 wherein said device defines a second conductive path passing from said G conductor between said A conductive path and sad B conductive path and back to said G conductor without encircling either said A conductive path or said B conductive path.

73. A method of making an energy conditioner comprising:

providing an A conductor including an A overlap portion and an A1 tab, said A overlap portion has A major surfaces, A side edges between said A major surfaces;

providing a B conductor including a B overlap portion and a B1 tab, said B overlap portion has B major surfaces, and B side edges between said B major surfaces;

providing a G conductor including a G overlap portion, a G1 tab, and a G2 tab;

providing at least one dielectric material;

wherein said A overlap portion, said B overlap portion, and said G overlap portion define an overlap region;

wherein said G overlap portion is between said A overlap portion and said B overlap portion in said overlap region;

wherein said A overlap portion, said B overlap portion, and said G overlap portion are conductively isolated from one another in the overlap region;

wherein said G conductor is conductively isolated from said A conductor and said B conductor; and

wherein said at least one dielectric material covers side edges of said A overlap portion and said B overlap portion.

74. A method of using an energy conditioner, said conditioner comprising:

an A conductor including an A overlap portion and an A1 tab, said A overlap portion has A major surfaces, A side edges between said A major surfaces;

a B conductor including a B overlap portion and a B1 tab, said B overlap portion has B major surfaces, and B side edges between said B major surfaces;

a G conductor including a G overlap portion, a G1 tab, and a G2 tab;

at least one dielectric material;

wherein said A overlap portion, said B overlap portion, and said G overlap portion define an overlap region;

wherein said G overlap portion is between said A overlap portion and said B overlap portion in said overlap region;

wherein said A overlap portion, said B overlap portion, and said G overlap portion are conductively isolated from one another in the overlap region;

wherein said G conductor is conductively isolated from said A conductor and said B conductor; and

wherein said at least one dielectric material covers side edges of said A overlap portion and said B overlap portion, said method comprising:

transmitting electrical signals or electrical power to said A conductor and said B conductor.